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ABSTRACT

Generalization of behavioral skills was assessed across situations, time, and other behaviors in a behaviorally based educational program, Preparation through Responsive Education Programs (PREP), which was designed to improve both inschool and out-of-school performance of junior high students with academic and/or social deficiencies. Students were reinforced for attendance, classwork, and behavior in three classes: mathematics, English, and social skills training. Individual programs were conducted for specific behavior problems. Generalization of group program effects across situations was assessed by grades in other school classes. PREP students showed significantly greater gains in other school subjects. Students showing most progress in PREP classes also showed greater gain in other classes. Generalization of individual behavioral programs occurred across time and other behaviors. (Author)

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# Generalization Across Time, Setting, and Behavior in an Educational Program

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## Generalization Across Time, Setting, and Behavior in an Educational Program

Behavior modification has been found to be an immediately effective training procedure for specific behavior problems in a variety of settings. However, the transfer of newly acquired behavioral skills from the treatment setting to other settings is often an important implied criteria in determining the overall effectivenss of a procedure. Kazdin and Bootzin (1972) propose that the generalization of treatment effects from a token economy should be an important and integral function of the original procedure. Yet, few studies demonstrate such attention to issues of generalization. Russell (1974) specifically criticizes behavioral techniques for lack of evidence that would support their ability to promote generalization.

O'Leary and Drabman (1971) and Wildman and Wildman (1975) emphasize the importance of obtaining generalization of behavioral effects within educational settings. Behavioral procedures may be both impractical and unimportant in the schools if generalization does not occur. Wildman and Wildman (1975) report that the results of both token and non-token programs in educational settings do not consistently demonstrate generalization of the learned behaviors.

Few studies (Blanchard and Johnson, 1973, is an exception) report generalization when specific procedures are not used to attain it. Baer, Wolf, and Risley (1968) instruct the researcher or practitioner that "Generalization should be programmed rather than expected...." Wildman and Wildman (1975) concur that "some program-

ming for generalization is necessary" and propose a number of tentative rules to promote generalization. Although designed specifically for consideration with token systems, these suggestions may be appropriate for non-token group settings. They also encourage the use of similar procedures with individual behavioral programs.

Procedures to insure generalization of specific behaviors across settings and time should be programmed. However, the effects of a behavioral change program may generalize beyond the specific behavior of concern. Parker (1974) and Gray, Graubard, and Rosenberg (1974) have found evidence for generalization beyond the specific behavior involved in the treatment program. Kazdin (1973) suggests that data should be collected on a range of behaviors other than those that are the focus of the behavioral program in order to assess potential generalization effects.

This paper, guided by the conceptual framework of Wildman and Wildman (1975), focuses on program intervention and the generalization of specific behaviors learned in special classrooms to other class settings. It follows Kazdin's (1973) suggestion and reports data for several individual students on behaviors other than the behavior which was the specific focus of an individual contract program. Generalization was assessed across three relevant continua suggested by O'Leary and Drabman (1971): situations, time, and behaviors. The results are described in the context of a behaviorally-based educational program for adolescents.

This behavioral program, Preparation through Responsive Educational Programs (PREP), is designed to improve both in-school and out-of-school performance of junior high school students with academic and/or social skill deficiencies. Academic instruction in English, reading, and mathematics is combined with a special class for training in social skills development. (See Cohen, Filipczak, Boren, Goding, Storm, Bishop, & Breiling, 1974; and Filipczak, Storm, & Breiling, 1973, for more complete descriptions of the PREP program.)

Friedman, Filipczak, and Fiordaliso (in press) report the effective generalization of academic behaviors with the PREP program in both suburban and rural school settings across a number of years. This paper focuses on PREP's activities in a large junior high school in the inner-urban area of an East Coast city during the 1975-76 school year. Generalization across settings was assessed according to the criterion suggested by Friedman et al. (in press), for a group design:

1. Changes must occur in the treatment setting itself. Such outcomes for this site and year are described in a report (Filipczak, Reese, Fennell, Bass, Kent, & Gilmore, Note 1) which indicates that PREP students exceeded control students in PREP course grades and other behavioral measures.
2. These changes must also be found in non-PREP class settings.
3. Individuals who demonstrated the largest changes in treatment settings (PREP classes) must also show the largest change in non-treatment settings.

Generalization across time and behavior continua was assessed by analyzing a sample of the results obtained for students placed on individual behavioral contracts. All of these students were participants in the larger PREP program.

## Method

A total of 98 students was selected to participate in the PREP program on the basis of teacher recommendations and concrete school-based criteria. The students were enrolled in PREP at a large (1400-student) urban junior high school with a 100% black student body, a large percentage of whom came from single-parent homes. The students were matched on the basis of sex, grade, and performance during the prior school year. They were then randomly assigned to experimental (PREP program) and control groups, yielding a total of 49 experimental/control student pairs. Approximately one-third of this total were in each of three school grades (seventh, eighth, and ninth). Only the data from eighth and ninth graders are reported here, as reliable pre-project information could not be obtained from the seventh graders' prior schools. The experimental students attended three special PREP classes, each taught by a different volunteer teacher from the regular school staff, and participated in regular school classes for the remainder of the seven-period school day. The control students were enrolled in seven regular school classes each day.

In each class (English, mathematics, and social skills), a variety of behavioral measures (attendance; class assignments finished; and behavioral ratings, completed by the student and checked by the

teacher) afforded the student a range of reinforcing tangible and activity consequences.

Most behaviors trained and/or required in PREP classes were reinforced with no delay at the beginning of school, with the length of delay gradually increased throughout the program year. In addition, a total of 25 individual behavior management contracts were developed during the school year for two types of students: (1) those having trouble achieving the desired social and academic behavior goals specified for the general program, and (2) those who were consistently exceeding the general standards. Contracts negotiated for problem students were usually devised to span one to two weeks. For students who performed exceptionally well, the contracts lasted from one to two and one-half months. The contracts focused on a variety of behaviors; for example, attendance in PREP classes and class assignments completed (work rate). Consequences were of both tangible and intangible types. A followup assessment was made for most contracts four to eight weeks after termination of the special program. Those that did not include a specific followup procedure terminated at the end of the school year.

## Results

Information from PREP and school-based sources were cumulated throughout the year, special testing occurred at the start and end of the school year, and all data were compiled for final analysis after conclusion of the school year.

An analysis of covariance on grades the students received in all school subjects (using prior year's grades as covariate) indicated that PREP students' grades improved significantly more than the control students ($p < .05$ for eighth graders, $p < .01$ for ninth graders). Analysis of covariance on grades received in all non-PREP subjects indicated a significant gain for PREP students ($p < .05$) as compared to controls. Since students in the three grades at the school are enrolled in a variety of courses, program generalization was assessed by comparing science and social studies grades (the only academic subjects in which most students were enrolled). An analysis of covariance (with prior school year's grades as the covariate) for grades in science and social studies indicated that ninth grade PREP students showed a significant ($p < .05$) increase in grades as compared to control students. Although a similar analysis showed no differences for eighth grade students, a test of proportions indicated that a significantly greater proportion of PREP students increased their social studies and science grades from the prior year as compared to the proportion of control students ($z = 1.66$, $p = .0485$).

To assess the relationship between student progress in PREP and non-PREP classes, a residual gain score was calculated for grades in PREP classes and in non-PREP classes. Pearson product moment correlations were computed between residual gain scores in the PREP classes of English and mathematics and the residual scores for non-PREP classes of social studies and science. A significant correlation

for eighth grade students between residual grade point average change in English and math and in social studies and science ($r$ = .64, $p$ = .025) was found for PREP students; a non-significant correlation for control students ($r$ = .37). For ninth grade students, the correlations for both groups were not significant (PREP, $r$ = .42; control, $r$ = .47).

A sample of four individual behavior-development programs (out of the total of 25 conducted during this year) are presented here to illustrate the extent to which behavior trained in this manner was found to generalize across time, setting, and behavior continua. Although the 25 total programs differed in some regard on their objectives, procedures, or outcomes, this sample offers a representative description of the types of generalization observed in each of the 25.

Figure 1 exemplifies the results from a short-term program that focused on improving the attendance of the student in one of his non-PREP classes.

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Insert Figure 1 about here

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Information from the teacher's record book on class attendance prior to the baseline week noted that Damon appeared in class no more than one day per week. Observations made by PREP staff during the baseline week showed he did in fact attend the class one out of five class days. Damon, PREP staff, and the teacher arranged a contingency

contract that would permit him to serve as an aide in that classroom each day, contingent on attendance the prior day. Damon's high level of academic and peer-related social skills could be used effectively by the teacher. This arrangement was in effect for three school weeks. Thereafter, he was permitted to act as an aide in class on a non-contingent basis. As noted, Damon's attendance remained at a 100% level the first week after the contingency was dropped. A followup conducted one month after the fifth week indicated an average attendance in this class of 79% (15 out of 19 school days). Clearly, generalization of this performance had been demonstrated across time, following a simple and effective procedure.

The second example focuses on the generalization of skill improvement across behavior, setting, and time. Figure 2 shows Peter's attendance and work rate (ratio of assignments completed) from baseline, contract and followup periods.

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Insert Figure 2 about here

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Peter and PREP staff arranged a contract that provided positive consequences contingent on improvements in work rate and attendance in his PREP classes. No arrangements were made for attendance in other classes. However, as illustrated, Peter made marked improvement in his rate of work completed during the contract period, his PREP class attendance improved slightly (from approximately 55% at baseline to 70% during contract), and attendance in non-PREP classes

increased from 8% during baseline to 75% during the PREP class attendance contract period. Followup data for each of the three behaviors show a decrement from the contract period, but retention of performance over baseline levels.

Figure 3 describes Dwayne's work rates in two PREP classes (separately and combined) for baseline; qualifying period (a special three-week contract, the attainment of which qualified the student as "Superstar"); and Superstar (followup and non-contingent reinforcement) period. Dwayne (as many others who participated in the Superstar program) earned Superstar status in PREP contingent on maintaining work rates higher than baseline periods. The qualifying period constituted a performance-contingent high reinforcement contract which permitted the student the perquisites (non-contingent reinforcement) of weekly reinforcement activity entrance. Once the student earned Superstar status, all reinforcement was made on a non-performance contingent basis.

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Insert Figure 3 about here

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As noted, his qualifying period work rates were substantial improvements over baseline (only minimally qualifying him for Superstar status). Thereafter, despite the lack of contingencies for reinforcement, his work rates (overall and in English) maintained over both baseline and contract conditions. Generalization of mathematics work rate across time was not remarkable, although improvement over baseline was evident.

Diane was another student whose low rate of class attendance aggravated her poor academic skills, class grades, and overall relations with the school. A one-week contract was established with her that provided intense and highly positive interactions with one PREP staff member and her English teacher, contingent on attendance in her English and math (PREP) classes.

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Insert Figure 4 about here

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As Figure 4 describes, her baseline rates of attendance in both PREP and total classes was less than 50%. During the one-week contract, attendance in both sets of classes improved to 100%. A decrement in attendance was found from contract to followup, but overall performance was maintained at standards acceptable to the school during the post-contract phase. Again, a demonstration of generalization of performance across settings and time pointed up the potential high and important impact of such low-cost procedures with high-problem behaviors.

## Discussion

Generalization of PREP program effects was assessed by comparing student performance in two non-PREP class subjects and determining the relationship between gains made in PREP special classes (math and English) and that made in the non-treatment classes (science and social studies). Despite the fact that ninth grade PREP students

received significantly higher science and social studies grades than did controls, there was not a significant relationship between gains they made in PREP and non-PREP subjects.

For eighth graders, a higher proportion of PREP students improved their grades in non-PREP subjects. Here, however, the absolute level of performance was higher for PREP students but not significantly different from controls. Correlative analysis with these data showed there was a significant relationship between grade gains in PREP and non-PREP subjects.

In general, the results appear to indicate that generalization of improved academic skills did occur for PREP students, although not as strongly as might be desired. Part of the increase in grades could be viewed as a reflection of improved behavior and/or attitude in these non-PREP classes. While an increase in grades probably reflects more work accomplished at greater accuracy, higher grades may also reflect a more positive teacher evaluation of students who demonstrate more appropriate behavior and a more positive "attitude" in class.

The behavior skill gains in PREP's group efforts appear to transfer to non-treatment situations when generalization is planned as part of the program. Generalization in token systems was encouraged by progressively increasing delay of reinforcement, treating the subject in an environment that approximated the non-treatment setting, focusing the program on skills that would be reinforced in non-treatment settings, and involving students in the rating of their behaviors.

PREP utilized these procedures as well as small, readily available reinforcers and instructions to students on how to maintain their behaviors in other classes. It is impossible to assess the effect of these procedures within the context of the larger group program, since all were continued throughout the school year. However, each clearly provides evidence that behavioral training can lead to a change in non-treatment settings if generalization is programmed.

The results of the individual behavioral programs are encouraging, as they show generalization of specific behavioral effects after termination of the contracts. Followup in all cases was conducted for the behaviors that were the specific focus of the contract. In cases for which data were maintained on behavioral measures in PREP classes, tardiness, school attendance, and behavior in non-PREP classes, evidence of generalization across behaviors was obtained. This suggests that behavioral procedures may have effects beyond the specific focus of the contract program. It also points out the importance of maintaining accurate behavioral records and assessing the effect on behaviors which are not the specific target of a behavioral program. While the sample cases analyzed may not be representative of results from all the individual programs conducted, the results are encouraging in that minimal procedures were employed to encourage generalization for each individual program. Although formal procedures were not implemented, the students were part of a general behavioral program in which skill behaviors were reinforced

and generalization encouraged. Because of a decrease in a specific behavior problem, a student would be more likely to engage in other appropriate behaviors and thus receive reinforcement in both treatment and non-treatment settings.

Thus, the PREP program appears to have been successful in encouraging generalization of improved academic and behavioral skills during a program year. More and longer-term followup is planned to determine if these effects will be maintained in the years following program participation.

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Figure 1

Damon's Attendance

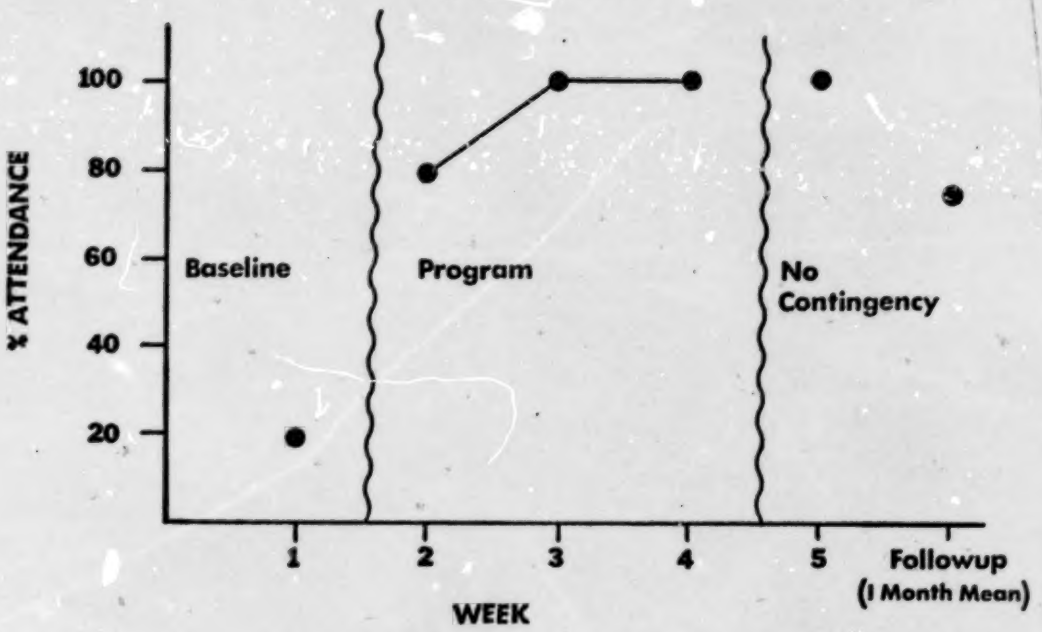


Figure 2

Peter's Work Rate and Attendance

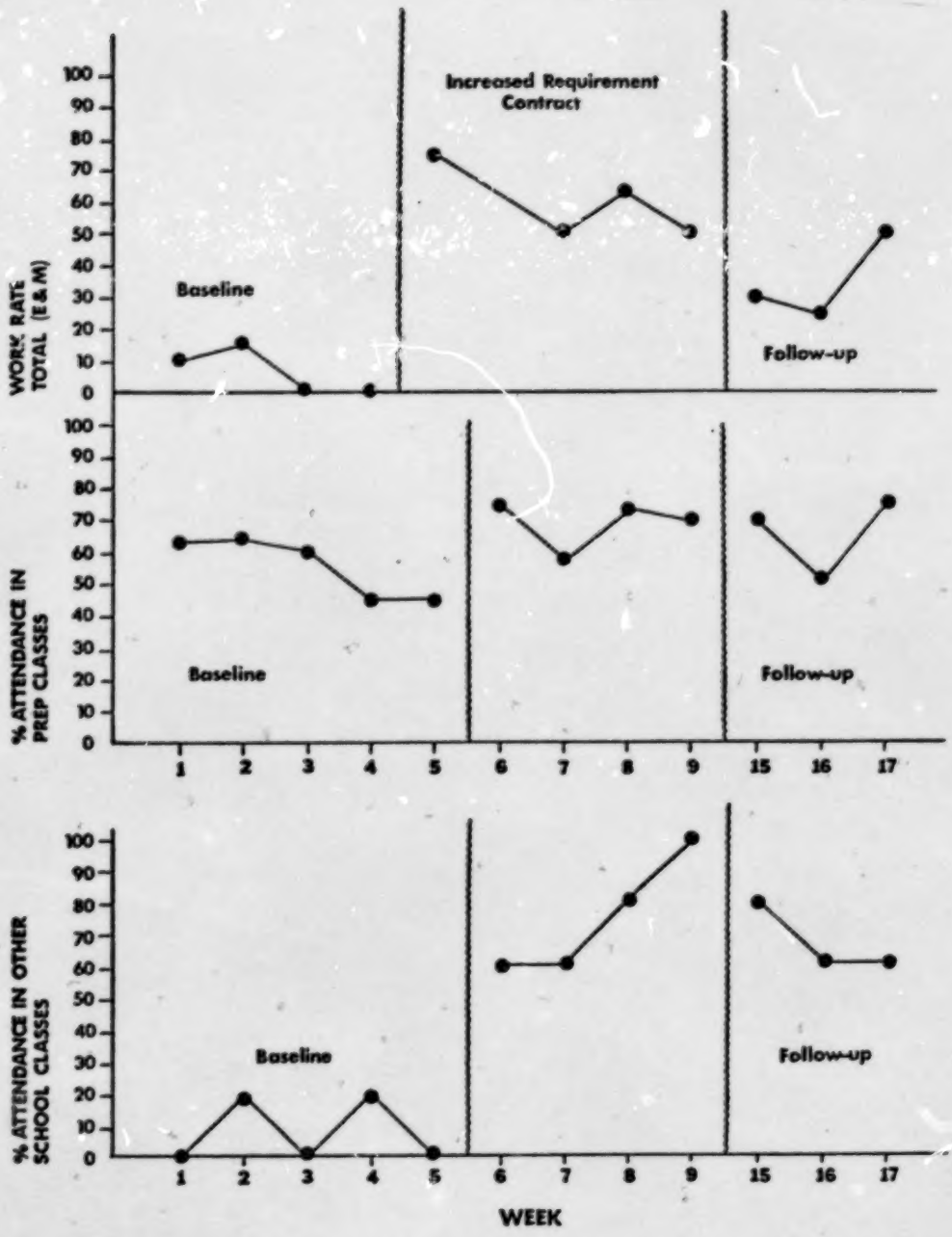
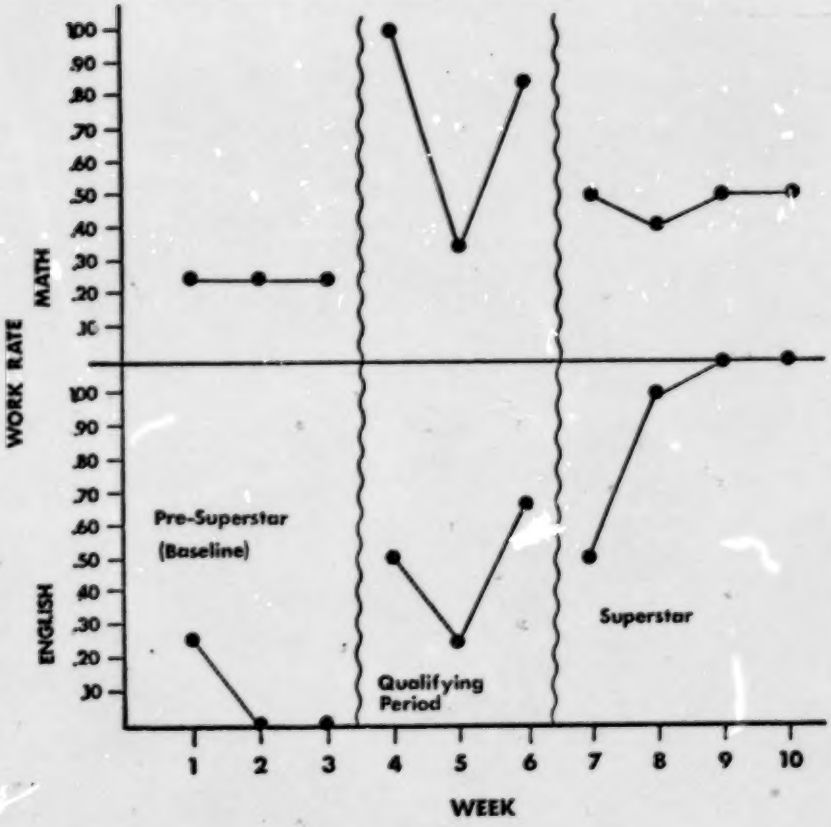


Figure 3

Dwayne's Work Rates in Math and English



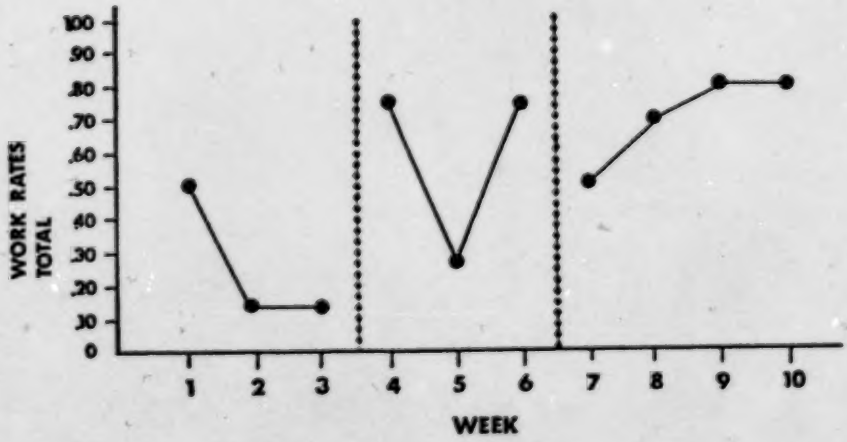



Figure 4

Diane's Attendance